

WHAT IS CLAIMED IS:

1. A fiber optic cable comprising:
at least one optical fiber;
at least one material;
said at least one optical fiber being at least partially embedded within said at least one material, said at least one material forming a housing that protects said at least one optical fiber; and
said at least one material having a Shore A hardness of about 75 or less.
2. The cable according to Claim 1, said at least one material having a tensile modulus at 300% elongation in the range of about 1100 psi or less measured using ASTM method D-638.
3. The cable according to Claim 1, said at least one material being a thermoset elastomer which have bonded to form a three dimensional network.
4. The cable according to Claim 3, wherein said thermoset elastomer includes a first thermoset elastomer material forming a core and a second thermoset elastomer forming a cladding around said first thermoset elastomer material.
5. The cable according to Claim 1, said at least one material being at least one thermoplastic material comprising: (i) about 10% to about 100% by weight of thermoplastic polymeric molecules which have bonded to form a three dimensional network substantially throughout said at least one thermoplastic material; and (ii) about 0% to about 90% of one or more additives that do not cause undesirable optical performance.

6. The cable according to Claim 5, wherein said at least one thermoplastic material includes a first thermoplastic material forming a core and a second thermoplastic material forming a cladding around said first thermoplastic material.

7. The cable according to Claim 6, wherein said first thermoplastic material possesses a Shore A hardness of about 25 or less.

8. The cable according to Claim 5, wherein said at least one thermoplastic material possesses a Shore A hardness of about 50 or less.

9. The cable according to Claim 5, wherein said at least one thermoplastic material possesses a melt flow at temperatures over about 80°C.

10. The cable according to Claim 9, wherein said at least one thermoplastic material possesses a melt flow at a temperature between about 90°C and about 125°C.

11. The cable according to Claim 5, wherein said at least one thermoplastic material does not possess a melt flow at temperatures of about 80°C or less.

12. The cable according to Claim 5, wherein said at least one thermoplastic material is flexible within a temperature range of from about -50°C to about 80°C.

13. The cable according to Claim 5, wherein said at least one thermoplastic material comprises at least about 20% by weight of said three dimensional polymeric network of said bonded thermoplastic polymeric molecules.

14. The cable according to Claim 5, wherein said at least one thermoplastic material comprises at least about 40% by weight of said three dimensional polymeric network of said bonded thermoplastic polymeric molecules.

15. The cable according to Claim 5, wherein said at least one thermoplastic material comprises at least about 80% by weight of said three dimensional polymeric network of said bonded thermoplastic polymeric molecules.

16. The cable according to Claim 5, wherein said thermoplastic polymeric molecules are thermoplastic elastomers.

17. The cable according to Claim 16, wherein said thermoplastic elastomers are block copolymers.

18. The cable according to Claim 17, wherein said block copolymers are selected from the group consisting of copolymers of styrene and butadiene, styrene and isoprene, styrene and ethylene, styrene and butylene, styrene and ethylene and butylene.

19. The cable according to Claim 17, wherein said block copolymer contains styrene end blocks.

20. The cable according to Claim 19, wherein said block copolymer is a styrene-ethylene/butylene-styrene block copolymer.

21. The cable according to Claim 16, wherein said thermoplastic elastomers are polyurethane elastomers or elastomeric alloys.

22. The cable according to Claim 5, wherein said thermoplastic polymeric molecules are thermoplastic rubbers.

23. The cable according to Claim 22, wherein said thermoplastic rubber is an olefinic rubber.

24. The cable according to Claim 23, wherein said olefinic rubber is an ethylene or propylene containing rubber.

25. The cable according to Claim 5, wherein said three-dimensional network comprises polymeric molecules with rigid domains which disassociate with the application of heat and harden thereby locking the three dimensional network in place when heat is removed.

26. The cable according to Claim 5, wherein said one or more additives is selected from the group consisting of plasticizers, lubricants, foaming agents, heat stabilizers, flame retardants, antioxidant pigments, dyes and fillers.

27. The cable according to Claim 5, wherein one of said one or more additives is a plasticizer.

28. The cable according to Claim 27, wherein said plasticizer is present in an amount greater than about 10% by weight based upon said at least one thermoplastic material.

29. The cable according to Claim 27, wherein said plasticizer is present in an amount less than about 10% by weight based upon said at least one thermoplastic material.

30. The cable according to Claim 5, wherein one of said one or more additives is a foaming agent.

31. The cable according to Claim 5, wherein said at least one thermoplastic material comprises gas bubbles dispersed throughout the three-dimensional network forming a foam.

32. The cable according to Claim 31, wherein said foam is generated through mechanical, chemical, or physical means.

33. The cable according to Claim 31, wherein said foam is generated with chemical foaming agents.

34. The cable according to Claim 5, wherein said at least one thermoplastic material contains no petroleum based oils, waxes or greases.

35. The cable according to Claim 5, wherein said at least one thermoplastic material contains no silica.

36. A fiber optic cable comprising:
at least one optical fiber;
at least one thermoplastic material;
said at least one optical fiber being at least partially embedded within said
at least one thermoplastic material, said at least one thermoplastic material forming
a housing that protects said at least one optical fiber; and
said at least one thermoplastic material comprises: (i) about 10% to about
100% by weight of thermoplastic polymeric molecules which have bonded to form
a three dimensional network substantially throughout said at least one
thermoplastic material; and (ii) about 0% to about 90% of one or more additives
that do not cause undesirable optical performance, and said at least one
thermoplastic material possesses a Shore A hardness of about 50 or less, a melt
flow at temperatures over about 80°C and does not possess a melt flow at any
temperature below about 80°C.
37. The cable according to Claim 36, wherein said at least one
thermoplastic material includes a first thermoplastic material forming a core and a
second thermoplastic material forming a cladding around said first thermoplastic
material.
38. The cable according to Claim 36, wherein said first thermoplastic
material possesses a Shore A hardness of about 25 or less.
39. The cable according to Claim 36, said at least one material having a
tensile modulus at 300% elongation in the range of about 1100 psi or less
measured using ASTM method D-638.

40. A fiber optic cable comprising:
at least one optical fiber;
at least one thermoplastic material;
said at least one optical fiber being at least partially contacting said at least one thermoplastic material, said at least one thermoplastic material forming a housing that protects said at least one optical fiber; and
said at least one thermoplastic material comprises: (i) a thermoplastic block copolymer of styrene-ethylene/butadiene-styrene molecules which have bonded to form a three dimensional network substantially throughout said at least one thermoplastic material, said block copolymer is present in an amount of about 10% to about 100% by weight based upon said at least one thermoplastic material, and (ii) about 0% to 90% of an additive or additives that do not cause undesirable optical performance, and said at least one thermoplastic material possesses a Shore A hardness of about 25 or less.

41. The cable according to Claim 40, wherein said at least one thermoplastic material includes a first thermoplastic material forming a core and a second thermoplastic material forming a cladding around said first thermoplastic material.

42. The cable according to Claim 40, wherein said first thermoplastic material possesses a Shore A hardness of about 10 or less.

43. The cable according to Claim 40, said at least one material having a tensile modulus at 300% elongation in the range of about 1100 psi or less measured using ASTM method D-638.